

CLAIMS:

1. A kitchen ventilation system comprising:
a sensor for detecting a chemical composition over an active zone of a cooktop;
an air moving device for displacing air including the chemical composition;
an air flow direction control device for directing air displaced by the air moving device between exhaust and recirculation flow paths; and
control circuitry coupled to the sensor, to the air moving device and to the air flow direction control device for regulating operation of the air moving device and a position of the air flow direction control device based upon signals from the sensor.
2. The system of claim 1, wherein the chemical composition is selected from the group comprising of cooking fumes, vapors, smoke and combustion byproducts.
3. The system of claim 1, wherein the sensor comprises at least one of a heated metal oxide gas sensor, an electro-chemical gas sensor, pellistors, a hot wire catalytic gas sensor, a semiconductor gas sensor, a photo ionization smoke detectors, a thermal conductivity type gas sensor, an ultrasonic gas sensor, a UV flame sensor, an IR temperature sensor, a heat flux sensor and a air velocity sensor.
4. The system of claim 1, wherein the sensor is further configured to acquire temperature and humidity data over an active zone of the cooktop.
5. The system of claim 1, wherein the control circuitry comprises of a controller with a set of pre defined stored programs that can be individually executed by a user of the system.
6. The system of claim 1, wherein the control circuitry comprises of a controller configured to compute temperature and humidity compensated response of

an air quality sensor based upon temperature and humidity data acquired over the active zone of the cooktop.

7. The system of claim 1, wherein the control circuitry comprises of a controller that receives and transmits signals pertaining to the status of air quality and corresponding control and display signals remotely through at least one of infrared, radio frequency and electromagnetic transmission modes.

8. The system of claim 1, further comprising an air purification device for reducing content of the chemical composition in the displaced air.

9. The system of claim 8, wherein the air purification device is an active device.

10. The system of claim 8, wherein the air purification device is a corona discharge device.

11. The system of claim 8, wherein the air purification device is a UV air purification device.

12. The system of claim 8, wherein the air purification device comprises a filter to facilitate odor destruction and microorganism destruction.

13. The system of claim 8, wherein the air purification device comprises grease filter.

14. A method for ventilating air over an active side of a cooktop comprising:

sensing a side of a cooktop on which cooking is performed;

controlling an air moving device for displacing air from the cooktop and an air flow direction control device for directing air displaced by the air moving device

between exhaust and recirculation flow paths based upon the sensed side of the cooktop.

15. The method of claim 14, wherein sensing a side of a cooktop comprises detecting a chemical composition over the cooktop through a sensor.

16. The method of claim 15, wherein the chemical composition is selected from a group comprising of cooking fumes, vapors, smoke and combustion byproducts.

17. The method of claim 15, wherein the sensor comprises at least one of a heated metal oxide gas sensor, an electro-chemical gas sensor, pellistors, a hot wire catalytic gas sensor, a semi-conductor gas sensor, a photo ionization smoke detectors, a thermal conductivity type gas sensor, an ultrasonic gas sensor, a UV flame sensor, an IR temperature sensor, a heat flux sensor and a air velocity sensor.

18. The method of claim 14, wherein sensing a side of a cooktop further comprises acquiring temperature and humidity data over an active zone of the cooktop.

19. The method of claim 14, wherein the controlling step comprises of receiving and transmitting signals pertaining to the status of air quality and corresponding control and display signals remotely through at least one of infrared, radio frequency and electromagnetic transmission modes.

20. The method of claim 14, wherein the controlling step comprises executing a set of pre defined programs stored in a controller by a user.

21. The method of claim 14, further comprising purifying of the air over the active side of the cooktop through an air purification device by reducing content of the chemical composition sensed by the sensor over the cooktop.

22. A kitchen ventilation system comprising:
a sensor for detecting an operating parameter of a cooktop;
an air moving device for displacing air from the cooktop;
an air flow direction control device for directing air displaced by the air moving device between exhaust and recirculation flow paths; and
control circuitry coupled to the sensor, to the air moving device and to the air flow direction control device for regulating operation of the air moving device and a position of the air flow direction control device based upon signals from the sensor, wherein operation of the control circuitry is configurable based upon site-specific factors of a site in which the ventilation system is installed.

23. The system of claim 22, wherein the sensor comprises at least one of a heated metal oxide gas sensor, an electro-chemical gas sensor, pellistors, a hot wire catalytic gas sensor, a semi-conductor gas sensor, a photo ionization smoke detectors, a thermal conductivity type gas sensor, an ultrasonic gas sensor, a UV flame sensor, an IR temperature sensor, a heat flux sensor and a air velocity sensor.

24. The system of claim 22, wherein the operating parameter is a chemical composition of air over an active zone of the cooktop.

25. The system of claim 24, wherein the chemical composition is selected from a group comprising of cooking fumes, vapors, smoke and combustion byproducts.

25. The system of claim 22, wherein the operating parameter is temperature of air over the active zone of the cooktop.

26. The system of claim 22, wherein the operating parameter is humidity of air over the active zone of the cooktop.

27. The system of claim 22, wherein the site-specific factors include at least one of hood width, site dimensions, installation location, height above the cooktop and type of fuel.

28. The system of claim 22, further comprising an air purification device for reducing content of the chemical composition in the displaced air.

29. The system of claim 28, wherein the air purification device is an active device.

30. The system of claim 28, wherein the air purification device is a corona discharge device.

31. The system of claim 28, wherein the air purification device is a UV air purification device.

32. The system of claim 28, wherein the air purification device comprises a filter to facilitate odor destruction and microorganism destruction.

33. The system of claim 28, wherein the air purification device comprises grease filter.

34. A kitchen ventilation system comprising:
a sensor for detecting an operating parameter of a cooktop;
an air displacement system including an air moving device for displacing air from the cooktop, and an air flow direction control device for directing air displaced by the air moving device between exhaust and recirculation flow paths; and
control circuitry coupled to the sensor and to the air displacement system for regulating operation of the air displacement system based upon signals from the sensor and upon characteristics of the air displacement system to reduce acoustic noise of the ventilation system during operation.

35. The system of claim 34, wherein the sensor comprises at least one of a heated metal oxide gas sensor, an electro-chemical gas sensor, pellistors, a hot wire catalytic gas sensor, a semi-conductor gas sensor, a photo ionization smoke detectors, a thermal conductivity type gas sensor, an ultrasonic gas sensor, a UV flame sensor, an IR temperature sensor, a heat flux sensor and a air velocity sensor.

36. The system of claim 34, wherein the operating parameter is a chemical composition of air over an active zone of the cooktop.

37. The system of claim 36, wherein the chemical composition is selected from a group comprising of cooking fumes, vapors, smoke and combustion byproducts.

38. The system of claim 34, wherein the operating parameter is temperature of air over the active zone of the cooktop.

39. The system of claim 34, wherein the operating parameter is humidity of air over the active zone of the cooktop.

40. The system of claim 34, wherein the characteristics of the air displacement system comprises a set of operating set point references for the air displacement system.

41. The system of claim 34, wherein the characteristics of the air displacement system comprises a set of operating cycle timing references for the air displacement system.

42. The system of claim 34, wherein the characteristics of the air displacement system comprises a ventilation rate look-up table for the air displacement system.